

WHAT IS CLAIMED IS:

1. In a motorized operator for a swing door, a frame adapted to support a motor and a gear reduction drive mechanism operably connected to said motor, said gear reduction drive mechanism including an output shaft adapted to
5 be operable for moving a door in one direction and in an opposite direction, an energy storage member operably connected to said gear reduction drive mechanism, a member mounted on said output shaft and drivingly engaged with a flexible member connected to said energy storage member
10 whereby in response to rotation of said output shaft in one direction energy is stored in said energy storage member and said energy storage member is operable to return energy through said flexible member to said output shaft to rotate said output shaft in an opposite direction.

2. The invention set forth in Claim 1 wherein:
said energy storage member comprises a spring.

3. The invention set forth in Claim 2 wherein:
said spring comprises a coil compression spring.

4. The invention set forth in Claim 1 wherein:
said flexible member includes opposed ends connected to an elongated shaft member operably engaged with said energy storage member and movable linearly in opposite directions to
5 store energy in and return energy from said energy storage member to said output shaft by way of said flexible member.

5. The invention set forth in Claim 4 wherein:
said member mounted on said output shaft comprises a sprocket and said flexible member comprises a chain engaged with said sprocket.

6. The invention set forth in Claim 5 wherein:
said chain includes opposed runs, each run being connected to a member operable to transfer forces between said energy storage member and said sprocket.

7. The invention set forth in Claim 6 wherein:
said member operable to transfer forces comprises an elongated shaft, said energy storage member comprises a spring, and a member engaged with said spring at one end thereof and with said elongated shaft for exerting compression forces on said spring and returning spring compression forces through said elongated shaft to said chain.

8. The invention set forth in Claim 7 including:
a link member connected to said elongated shaft and to said opposed runs of said chain, said link member being mounted for limited pivotal movement on said elongated shaft.

9. The invention set forth in Claim 1 wherein:
said frame includes a pair of spaced apart plates for supporting parallel shafts of said gear reduction mechanism including said output shaft and said frame includes opposed end plates connected to said pair of plates.

10. The invention set forth in Claim 9 wherein:
one of said end plates supports a motor and the opposite end plate is operably engaged with said energy storage member.

11. The invention set forth in Claim 10 wherein:

said frame includes opposite faces adapted to be mounted on a support plate for selectively positioning said frame with respect to said support plate.

12. In a motorized operator for a swing door, a frame adapted to support a motor and a gear reduction drive mechanism operably connected to said motor, said gear reduction drive mechanism including an output shaft adapted to
5 be operable for moving a door in one direction and in an opposite direction, a coil spring energy storage member operably connected to said gear reduction drive mechanism, a sprocket mounted on said output shaft and drivingly engaged with a flexible member trained around said sprocket and
10 including opposed runs operably connected to said spring whereby in response to rotation of said output shaft in one direction or the other energy is stored in said spring and said spring is operable to return energy through said flexible member to said output shaft to rotate said output shaft in an
15 opposite direction.

13. The invention set forth in Claim 12 wherein:

said flexible member includes opposed ends connected to an elongated shaft member operably engaged with said spring and movable linearly in opposite directions to store energy in
5 and return energy from said spring to said output shaft by way of one or the other of said runs of said flexible member.

14. The invention set forth in Claim 13 wherein:
said flexible member comprises a roller chain.

15. In a motorized operator for a swing door, a frame adapted to support a motor and a gear reduction drive mechanism operably connected to said motor, said gear reduction drive mechanism including an output shaft adapted to
5 be operably connected to a door for moving said door in one direction and in an opposite direction, a coil spring energy storage member operably connected to said output shaft by way of a sprocket mounted on said output shaft and drivingly engaged with a chain trained over said sprocket and having
10 opposed runs operably connected to said spring whereby in response to rotation of said output shaft in one direction one of said runs becomes taut and the other run becomes slack while energy is stored in said spring and said spring is operable to return energy through said one run to said output
15 shaft to rotate said output shaft in an opposite direction.

16. The invention set forth in Claim 15 including:
a member operably connected to said spring comprising an elongated shaft, and a member engaged with said spring at one end thereof and with said elongated shaft for
5 exerting compression forces on said spring and returning spring compression forces through said elongated shaft to said chain.

17. The invention set forth in Claim 16 including:
a link member connected to said elongated shaft and to said opposite runs of said chain, said link member being mounted for limited pivotal movement on said elongated shaft.

18. The invention set forth in Claim 15 wherein:
said frame includes a pair of spaced apart plates for supporting parallel shafts of said gear reduction mechanism including said output shaft and said frame includes
5 opposed end plates connected to said pair of plates.

19. The invention set forth in Claim 18 wherein:
one of said end plates supports a motor and the opposite end plate is operably engaged with said energy storage member.

20. The invention set forth in Claim 18 wherein:
said frame includes opposed faces adapted to be mounted on a support plate for selectively positioning said frame with respect to said support plate.